LIST OF CONTENTS

NUMBER 1

S. A. Barnett	1	A new solid oxide fuel cell design based on thin film electrolytes
Edward L. Vine and **Jeffrey P. Harris**	11	Evaluating energy and non-energy impacts of energy conservation programs: a supply curve framework of analysis
Yousef H. Zurigat, Kiyoung Bang, and **Afshin J. Ghajar**	23	Methods for producing linear density gradients in laboratory tanks
H.-J. Ehmke	35	Size optimization for cogeneration plants
T. A. Reddy	45	Statistical analyses of electricity use during the hottest and coolest days of summer for groups of residences with and without air-conditioning
Lin Wenxian	63	Optimum inclination of south-facing solar collectors during the cooling season in China
E. Taşdemiroğlu	67	Solar energy R&D, technology and economics in Turkey
Software Survey Section	I	

NUMBER 2

H.-M. Groscurth and **R. Kümmel**	73	Thermoeconomics and CO_2-emissions
Peter S. K. Chi and **Joseph Laquatra**	81	Energy efficiency and radon risks in residential housing
L. D. Danny Harvey	91	Managing atmospheric CO_2: policy implications
H. S. Couto, J. A. Carvalho, Jr., and **E. M. Queiroz**	105	Analysis of self-aspirating combustion systems
W. L. R. Gallo and **L. F. Milanez**	113	Choice of a reference state for exergetic analysis
Ho-Ming Yeh and **Lie-Chaing Chen**	123	Experimental studies on upward-type double-effect solar distillers
M. S. Alam, A. M. Z. Huq, and **B. K. Bala**	131	An integrated rural energy model for a village in Bangladesh
Note		
E. Taşdemiroğlu and **K. Geçit**	141	Experimental evaluation of a solar-heated test room
Software Survey Section	I	

NUMBER 3/4

ENGINEERING–ECONOMIC MODELING: ENERGY SYSTEMS

Part I

Preface v

SECTION 1: MODELING FOR POLICY DEVELOPMENT

Ryo Imoto 145 Government's point of view on modeling

Arnold B. Baker and **Anthony J. Finizza** 149 Corporate point of view on modeling

Walter C. Labys 155 Evaluation of models

Yoichi Kaya 163 Credibility of models

Paul J. Werbos 171 Rational approaches to identifying policy objectives

John P. Weyant 187 Application of models in the process of legislation

John P. Weyant 203 Policy modeling: an overview

SECTION 2: DEMAND FORECASTING METHODOLOGIES

Andrew J. Lipinski 207 Introduction

Paul J. Werbos 213 Econometric techniques: theory versus practice

Walter C. Labys and **Hiroshi Asano** 237 Process models

David B. Reister 249 The hybrid approach to demand modeling

Bertrand Chateau and **Bruno Lapillonne** 261 Accounting and end-use models

Andrew J. Lipinski 279 Probabilistic forecasting

Ahmad Faruqui, **Thomas Kuczmowski**, and **Peter Lilienthal** 285 Demand forecasting methodologies: an overview for electric utilities

SECTION 3: MODELING ENERGY–ECONOMY INTERACTIONS

William W. Hogan and **Shailendra C. Parikh** 297 Modeling interactions

P. Capros, **P. Karadeloglou**, **G. Mentzas**, and **J.-E. Samouilidis** 301 Short and medium-term modeling and problems of models linkage

Xia Shi and **Yingzhong Lu**	325	Multisectoral planning models
Walter C. Labys and **John P. Weyant**	341	Integrated models
Gale Boyd, John Fox, and **Donald Hanson**	345	Set of models
Nazli Choucri and **Christopher Heye**	363	Simulation models
Andrew J. Lipinski	379	Cross-impact models
Janusz Cofala, Thomas Kuczmowski, and **John Weyant**	387	Energy–economy modeling: a survey
Software Survey Section	I	

NUMBER 5

Fayez H. Al-Sadah, Farouk M. Ragab, and **Mirza K. Arshad**	395	Hourly solar radiation over Bahrain
Eric Hirst and **Charles Goldman**	403	Review of demand-side data needs for least-cost utility planning
J. David Fuller and **Damyant Luthra**	413	Model formulation with the Waterloo Energy Modelling System (WATEMS)
Syed M. Zubair	427	Improvement of refrigeration/air-conditioning performance with mechanical sub-cooling
Göran Wall	435	Exergy conversion in the Japanese society
T. K. Das, D. Chakraborty, and **Swapan Seth**	445	Energy consumption and prospects for renewable energy technologies in an Indian village
D. Michalopoulos and **G. Massouros**	451	Energy conservation in the canning industries: a study of transient heat transfer in cylindrical enclosures
Vojin Grković	459	Selection of the optimal extraction pressure for steam from a condensation-extraction turbine
Software Survey Section	I	

NUMBER 6

G. Stavrakakis, G. Bitsoris, and **M. Santamouris**	467	A nonlinear dynamic thermal regulator for a paraboloidal solar collector
R. D. Palumbo and **C. L. Larson**	479	Production of C from CO_2 in a two-step solar process utilizing FeO and Fe_3O_4

S. C. Saxena and **N. S. Rao** 489 Pressure fluctuations in a gas fluidized bed and fluidization quality

S. C. Bhattacharya, **Sivasakthy Sett,** and **Ram M. Shrestha** 499 Two approaches for producing briquetted charcoal from wastes and their comparison

Stephen C. Lonergan, **Robert L. Goble,** and **Caesar Cororaton** 507 Estimating the financial consequences of a severe nuclear accident in Canada

Molly Longstreth and **Michael Topliff** 523 Determinants of energy savings and increases after installing energy-conserving devices

Software Survey Section I

NUMBER 7/8

ENGINEERING–ECONOMIC MODELING: ENERGY SYSTEMS

Part II

Preface v

SECTION 4: SUPPLY OPTIMIZATION METHODOLOGIES

Walter C. Labys and **Thomas Kuczmowski** 539 Normative models: survey and prescriptions

Walter C. Labys 545 Econometric supply models

Manfred Kleemann and **Dieter Wilde** 549 Intertemporal capacity expansion models

Andy S. Kydes 561 Flow models

Leslie A. Poch and **R. T. Jenkins** 573 Dynamic programming models

J. Psarras, P. Capros, and **J.-E. Samouilidis** 583 Multiobjective programming

Walter C. Labys, **Thomas Kuczmowski,** and **Gerd Infanger** 607 Special programming models

Walter C. Labys and **Thomas Kuczmowski** 619 Remarks on supply optimization

SECTION 5: FROM MODELS TO DECISIONS

Oliver S. Yu 621 Interface between mental and computer models

Lev S. Belyaev	631	Pay-off matrix technique
Robert Entriken and **Gerd Infanger**	645	Decomposition and importance sampling for stochastic linear models
Thomas R. Bowe, William D. Dapkus, and **James B. Patton**	661	Markov models
Douglas M. Logan	677	Decision analysis in engineering-economic modeling

SECTION 6: TRENDS IN MODELING

William A. Buehring	697	Energy and economic modeling on the microcomputer
A. Reuter and **A. Voss**	705	Tools for energy planning in developing countries
Yuri Kononov	715	Trends and peculiarities in applying models to the planned-economy countries
Software Survey Section	I	

NUMBER 9

M. B. Richards	729	Reaction of nuclear-grade graphite with low concentrations of steam in the helium coolant of an MHTGR
C. Berger, D. Fuller, A. Haurie, R. Loulou, D. Luthra, and **J.-P. Waaub**	741	Modelling energy use in the mineral processing industries of Ontario with MARKAL-Ontario
M. Bojic	759	Evaluation of steam-trap types using a non-integer rating method
Lin Wenxian, Lu Enrong, and **Wang Dongcheng**	767	A model for thermosyphon solar water heaters assisted by auxiliary electric heaters
Franz Wirl	773	Efficient tariffs to market district heat
D. Khummongkol and **W. Arunlaksadamrong**	781	Performance of an updraft mangrove-wood gasifier
Benjamin F. Hobbs and **Pravin Maheshwari**	785	A decision analysis of the effect of uncertainty upon electric utility planning
R. Choudhury, T. Kayal, and **M. Chakravarty**	803	Performance of materials used in the walls of intermittent ceramic kilns
M. Y. Boluk, M. Aktik, and **E. Bilgen**	811	Energy requirements and cost in polymer curing processes
Alfredo Behrens and **Stefano Consonni**	821	Hot showers for ethanol rich countries

Note
Tushar Jash 831 Loss of fertilizer and fuel value of dung cake

Software Survey Section I

NUMBER 10

John H. Herbert and **Jon Berg** 833 Soviet natural gas exports and the European energy balance

Stephen Tyler and **Lee Schipper** 841 The dynamics of electricity use in Scandinavian households

B. C. Akinoğlu and **A. Ecevit** 865 A further comparison and discussion of sunshine-based models to estimate global solar radiation

Philip Varghese and **Kwa-Sur Tam** 873 Structures for superconductive magnetic energy storage

Damyant Luthra and **J. David Fuller** 885 Exploring regional energy futures in Canada: a techno-economic energy model for Ontario

Constantinos A. Balaras 899 A review of augmentation techniques for heat transfer surfaces in single-phase heat exchangers

M. Shyam and **L. P. Gite** 907 Energy analysis of soybean–wheat crop rotation under rainfed conditions of Central India

C. Subhash and **P. S. Satsangi** 913 An integrated planning and implementation-strategy for rural energy systems

R. K. Panda, T. K. Sarkar, and **A. K. Bhattacharya** 921 Stochastic study of the wind-energy potential of India

Note
W. E. Alnaser and **A. H. Almohanadi** 931 Wind and solar energy in Qatar

Software Survey Section I

NUMBER 11

Allen L. Rutz and **Michael J. Moran** 935 Rule-based thermostat design for night setback of heat pumps

Sibel Özdoğan and **Mahir Arıkol** 943 On the feasibility of process steam production options in Turkey

Jonathan A. Lesser 949 Application of stochastic dominance tests to utility resource planning under uncertainty

A. Tamimi and **K. Rawajfeh** 963 Analysis and performance of an extended-surface, tubeless, flat-plate solar collector

Joseph H. Eto 969 An overview of analysis tools for integrated resource planning

Won Y. Lee, Sang S. Kim, and **Seung H. Won** 979 Finite-time optimizations of a heat engine

Tushar Jash and **D. N. Ghosh** 987 Studies on residence time distribution in cylindrical and rectangular biogas digesters

Stig-Inge Gustafsson and **Björn G. Karlsson** 993 Natural gas in optimized bivalent heating systems

S. C. Saxena, N. S. Rao, and **S. J. Zhou** 1001 Fluidization characteristics of gas fluidized beds at elevated temperatures

Shyh-Ching Yang, Ruey-Shin Juang, Wen-Chen Chang, and **Jen-Shien Chen** 1015 Velocity measurements and energy distribution for isothermal, suddenly-expanding, swirling flow in an industrial burner with bluff-body

Sergio Alvarado and **José Iribarne** 1023 Minimum energy requirements in industrial processes: an application of exergy analysis

F. Perelló-Aracena, H.-D. Haasis, and **O. Rentz** 1029 Future development of the energy sector in the Dominican Republic

E. Taşdemiroğlu and **M. Awad** 1035 Technical and economic aspects of solar space heating in Turkey

Ali M. El-Nashar 1051 Exergy and cost accounting of the UANE cogeneration plant

Notes

Baharudin Bin Yatim 1061 Domestic energy consumption in West Malaysia

M. Chakravarty and **T. Kayal** 1065 Experimental studies of a hybrid heat wheel

B. P. Bhatt and **A. K. Badoni** 1069 Characteristics of some mountain firewood shrubs and trees

C. E. Okeke, S. U. Egarievwe, and **A. O. E. Animalu** 1071 Effects of coal and charcoal on solar-still performance

NUMBER 12

M. Al-Ramadhan and **A. M. R. Al-Marafie** 1075 Assessment of oil and natural gas resources in the Gulf Cooperation Council countries

D. A. Hull and **T. A. Reddy** 1085 A procedure to group residential air-conditioning load profiles during the hottest days in summer

B. W. Ang and **C. C. Deng** 1099 The effects of maintenance on the fuel efficiency of public buses

Linda Berry and **Eric Hirst** 1107 The U.S. DOE least-cost utility planning program

Robert D. Perlack, **H. G. (Mike) Jones,** and **Daniel B. Waddle**	1119	A survey of renewable energy technologies for rural applications
Ho-Ming Yeh and **Chi-Chien Tseng**	1129	A thermosyphon water cooler with a parallel, flat-plate radiator
K. Ashenayi and **R. Ramakumar**	1143	IRES—a program to design integrated renewable energy systems
D. A. Kouremenos, **C. D. Rakopoulos,** and **P. Kotsiopoulos**	1153	Comparative performance and emission studies for vaporized diesel fuel and gasoline as supplements in swirl-chamber diesel engines
Ho-Ming Yeh and **Nien-Tung Ma**	1161	Energy balances for upward-type, double-effect solar stills
Lin Wenxian	1171	Simplified determination of annual and seasonal total extraterrestrial radiation incident on a horizontal surface
Ranu Pentananunt, **A. N. M. Mizanur Rahman,** and **S. C. Bhattacharya**	1175	Upgrading of biomass by means of torrefaction
Frank Kreith, Paul Norton, and **Daryl Brown**	1181	A comparison of CO_2 emissions from fossil and solar power plants in the United States